SITE: Chevron-Ortho
BREAK: 17.7 V7
OTHER:

Geologically, Orange County is underlain by marine limestone, dolomite, shale, sand, and anhydrite to approximately 6500 feet bls at which granite and other basement crystalline rocks occur (Ref.6,p.14). The youngest sediments in Orange County are Recent to Pliocene aged undifferentiated deposits of quartz sands with clay, hardpan and shells. These undifferentiated surficial deposits average approximately 40 feet in thickness and coincide with the unconfined surficial aquifer (Ref.6,p.85). Underlying these surficial soils are the limestones, dolomites and clays of the four primary geologic units occurring in Florida: the Hawthorn Group, the Ocala Group, the Avon Park Limestone, and the Lake City Limestone (Ref.4,p.8; Ref.6,p.16). Figure A (Ref.4,p.8), on the following page, presents a representation of the stratigraphic cross-section for the Orlando area of Orange County.

Regionally, the Miocene age Hawthorn Group extends from approximately 40 to 130 feet bls and is composed of thick, sandy clays and limestone layers (Ref.6,p.16). The low-permeability clays act as a semi-confining layer for the underlying Floridan aquifer (Ref.13,p.B43-B45). The Hawthorn Group consists of highly phosphatic sand, clay, and sandy clay which generally protect the Floridan from direct infiltration from the surface and overlying surficial aquifer; however, sinkholes and drainage wells have breached the Hawthorn strata providing vertical pathways for percolation through the permeable sediments thereby creating an interconnected aquifer system (Ref.12, p.13-15; Ref.13, p.B43-B45; Ref. 26; Ref. 27; Ref. 28; Ref. 31). Vertical hydraulic conductivity values for the Hawthorn clays as established from core analysis and aquifer tests range from 5.2×10^{-5} to 2.75×10^{-10} cm/sec (Ref.13,p.B43). The fine, granular limestone of the Ocala Group unconformably underlies the Hawthorn and is approximately 125 feet thick (Ref.6,p.20). The underlying Avon Park and Lake City limestones consist of alternating layers of hard, crystalline dolomite and fossiliferous limestone. Only a few wells penetrate into these Eocene-age formations, and the contact between them is indistinct, but the Avon Park Limestone is estimated between 400 and 600 feet thick, and the Lake City Limestone is considered to be over 700 feet thick (Ref.6,p.18).

The ground water regime within Orange County consists of an unconfined aquifer, extending from near land surface to a depth of approximately 40 feet, and the deeper and more extensive Floridan aquifer (Ref.3,p.2-7). More specifically, the surficial aquifer consists of Recent to Pleistocene aged undifferentiated deposits that overlay the Hawthorn formation. These deposits are composed of quartz sand with minor amounts of clay and shell (Ref.6,Table 2,p.16). The majority of the water wells that have been constructed into the unconfined aquifer in the Orange County area are of small diameter, but generally provide water sufficient for domestic purposes (Ref 24). In general, these wells may average 5 to 10 gallons per minute (gpm). The unconfined aquifer has been classified by EPA as a Class II aquifer, a potential source of drinking water, and a Class G-II aquifer, potable water use, based on the Florida Department of Environmental Regulation (FDER) F.A.C. 17-520.410 (Ref.24; Ref.25). In addition, Brown and Caldwell Consultants conducted in-situ permeability tests at Chevron Chemical to evaluate the surficial aquifer. The in-situ permeability tests were performed during the Contamination Assessment Report (CAR) investigation in October 1990 and the Remedial Action Report investigation in October 1991 (Ref. 30, p. 5-7). Based upon the results of this test, the surficial aquifer discharge was calculated to be 629 gallons per day (Ref. 30, p. 5-9). This is consistant with regional characteristics of the surficial aquifer. The ground water surface occurs at shallow depths in the vicinity of the site, and is usually located within 5 feet of the ground surface. The potentiometric surface in both the unconfined aquifer and deeper aquifer fluctuates seasonally (Ref.3,p.2-7). Regional ground water flow directions are estimated to be to the northeast and east

Geologically, Orange County is underlain by marine limestone,

3.3 TARGETS

Two municipal systems operate wells located within a 4-mile radius of the site. The Orlando Utilities Commission Water Department has 3 of 33 wells located 2.2 miles southeast at the intersection of Highland Drive and Orange Avenue. Water from these wells (approximate depth of 1,320 feet) is combined into their system for distribution to 93,000 homes in Orlando and surrounding counties (Ref.8; Ref.15). Well locations, depths, and distribution data was obtained from the Orlando Utilities Commission Water Department (Ref.15). Only 3 wells are located within a 4-mile radius of the site, therefore the 93,000 homes in the system was divided by 33 to show 2,818 homes for each well in the system. 2,818 homes was multiplied by 3 to report that 8,454 homes utilize the 3 wells that are located 2.2 miles from the site. Based on 1990 U.S. Census data for Orange County, a conversion factor of 2.56 persons per household was multiplied by 8,454 homes to determine that 21,643 people are served by the Orlando Utilities within a 4-mile radius of the site (Ref.8; Ref.15; Ref.18).

The Winter Park Utilities Water Department has 2 of 6 wells located 2.2 miles to the northeast at the intersection of Wymore Road and Lee Road. Water from these wells (approximate depth of 1,200 feet) is also combined with water from the other wells for distribution to 21,000 homes in the Orlando area (Ref.16). Well locations, depths, and distribution data was obtained from the Winter Park Utilities (Ref.16). Only 2 wells are located within a 4-mile radius of the site, therefore the 21,000 homes in the system was divided by 6 to show 3500 homes for each well in the system. 3500 homes was multiplied by 2 to report that 7000 homes utilize the 2 wells that are located 2.2 miles from the site. Based on 1990 U.S. Census data for Orange County, a conversion factor of 2.56 persons per household was multiplied by 7000 homes to determine that 17,920 people are served by the Winter Park Utilities within a 4-mile radius of the site (Ref.8; Ref.16; Ref.18).

Private wells do exist despite the extensive municipal water systems present within the 4-mile radius. Private well locations and depths were obtained from the Central Florida Well Drillers. The private wells are approximately 125 to 130 feet below land surface. This company was sent a topographic map of the area and were asked to locate all private wells. The map was labeled with relevant information (Ref.8; Ref.17). The nearest private well is located approximately 5200 feet south of the facility. This well is utilized by approximately 5 individuals. A house count taken from a U.S. Geologic Survey topographic map was used to determine the number of private wells in the designated location. Private wells are utilized by 572 homes for potable water approximately 2.5 to 4 miles northwest of the site (Ref.8; Ref.17). Based on 1990 U.S. Census data for Orange County, a conversion factor of 2.56 persons per household was multiplied by 132 homes to determine that 338 people are served by private wells in the 2-3 mile radius of the site. In addition, the conversion factor of 2.56 persons per household was multiplied by 440 homes to determine that 1126 people are served by private wells in the 3-4 mile radius of the site (Ref.8; Ref.17; Ref.18).

3.3.1 Nearest Well

Well: A private well at Keller Music is approximately 5200 feet south of the facility (Ref.8; Ref.17).

Level of Contamination (I, II, or potential): Potential

If potential contamination, distance from source in miles: The well is located approximately 0.9848 miles (5200 feet) from Chevron Chemical Company. The distance was obtained from Reference 8 and 17. This yields a factor value of 20.

Nearest Well Factor Value: 20

3.3.2 Population

3.3.2.4 Potential Contamination

Distance Category	Population	References	Distance-Weighted Population Value
1/2-1 mile	5	8;17	2
2-3 mile	39,900	15;16;17	26068
3-4 mile	14,126	8;17;18	817

Sum of Distance-Weighted Population Values: 26887

Potential Contamination Factor Value: 2689